

WHAT IS CLAIMED IS:

1. A barium titanate film synthesizing process comprising the steps of:
 - (a) coating a titanium film on the surface of a substrate; and
 - 5 (b) synthesizing a barium titanate film on the titanium-coated substrate in an electrolyte containing barium ions by electrochemically anodic oxidation.
2. The barium titanate film synthesizing process as claimed in claim 1, wherein said substrate is selected from a group of materials including titanium, glass,
10 ceramics, polymers, and silicon.
3. The barium titanate film synthesizing process as claimed in claim 1, wherein said titanium film is deposited on said substrate by sputtering.
- 15 4. The barium titanate film synthesizing process as claimed in claim 1, wherein said titanium film is deposited on said substrate by evaporation.
5. The barium titanate film synthesizing process as claimed in claim 1, wherein said electrolyte is an alkaline solution of $\text{Ba}(\text{CH}_3\text{COO})_2$ and NaOH .
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6. The barium titanate film synthesizing process as claimed in claim 5, wherein the concentration of $\text{Ba}(\text{CH}_3\text{COO})_2$ is within about 0.35~0.5 M; the concentration of NaOH is 2 M.
- 25 7. The barium titanate film synthesizing process as claimed in claim 1,

wherein said electrochemically anodic oxidation is achieved by voltage within 0.4 V~3 V.

8. The barium titanate film synthesizing process as claimed in claim 1,
5 wherein said electrochemically anodic oxidation is achieved by a voltage scan rate within 10 mV/s~50 mV/s.

9. The barium titanate film synthesizing process as claimed in claim 1,
wherein said electrochemically anodic oxidation is achieved within 20 seconds to 24
10 hours.

10. The barium titanate film synthesizing process as claimed in claim 1,
wherein said electrochemically anodic oxidation is performed at a processing
temperature within 30°C~90°C.
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11. The barium titanate film synthesizing process as claimed in claim 1,
wherein said electrochemically anodic oxidation is performed at a processing
temperature over 50°C.
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